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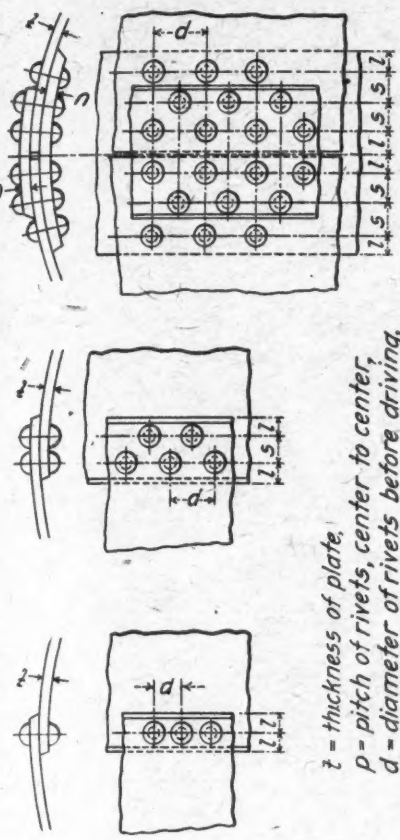
STANDARD PROPORTIONS OF RIVETED JOINTS FOR PRESSURE TANKS—I



t = thickness of plate,
p = pitch of rivets, center to center,
d = diameter of rivets before driving,
D = diameter of hole,
s = distance between lines of rivets,
l = distance from edge of plate to first line of rivets,
v = thickness of strap,
E = efficiency of joint in per cent.

Thickness of Plate t	Lap Joint Single Riveted					Lap Joint Double Riveted						Double Strap Butt Joint Triple Riveted						
	p	d	D	l	E	p	d	D	s	l	E	p	d	D	s	l	v	E
5/16	2	3/4	13/16	1 1/8	59	3 2/10	3/4	13/16	2	1 1/8	74	6	5/8	11/16	2 to 3 for all pitches	1 1/8	1/4	88
3/8	2 1/16	13/16	7/8	1 3/16	56	3 2/10	13/16	7/8	2	1 3/16	72	6	3/4	13/16		1 3/16	5/16	86
7/16	2 1/8	7/8	15/16	1 1/4	54	3 2/10	7/8	15/16	2	1 1/4	70	6 3/4	7/8	15/16		1 1/4	3/8	86
1/2	2 1/8	15/16	1	1 1/4	53	3	7/8	15/16	2	1 1/4	67	7	7/8	15/16		1 1/4	7/16	86
9/16	2 3/16	1	1 1/16	1 1/4	51	3 1/16	15/16	1	2	1 1/4	66	7	7/8	15/16		1 1/4	45/100	86
5/8						3 1/8	1	1 1/16	2	1 1/4	66	7.	7/8	15/16		1 1/4	1/2	86
11/16						3	1	1 1/16	2	1 1/4	62	7	15/16	1		1 1/4	9/16	85
3/4						2 7/8	1	1 1/16	2	1 1/4	60	7	15/16	1		1 1/4	9/16	85
13/16												7 1/4	1	1 1/16		1 1/4	5/8	85
7/8												7	1	1 1/16		1 3/8	5/8	84
15/16												7 1/4	1 1/8	1 3/16		1 3/8	11/16	83
1												7	1 1/8	1 3/16		1 3/8	3/4	83

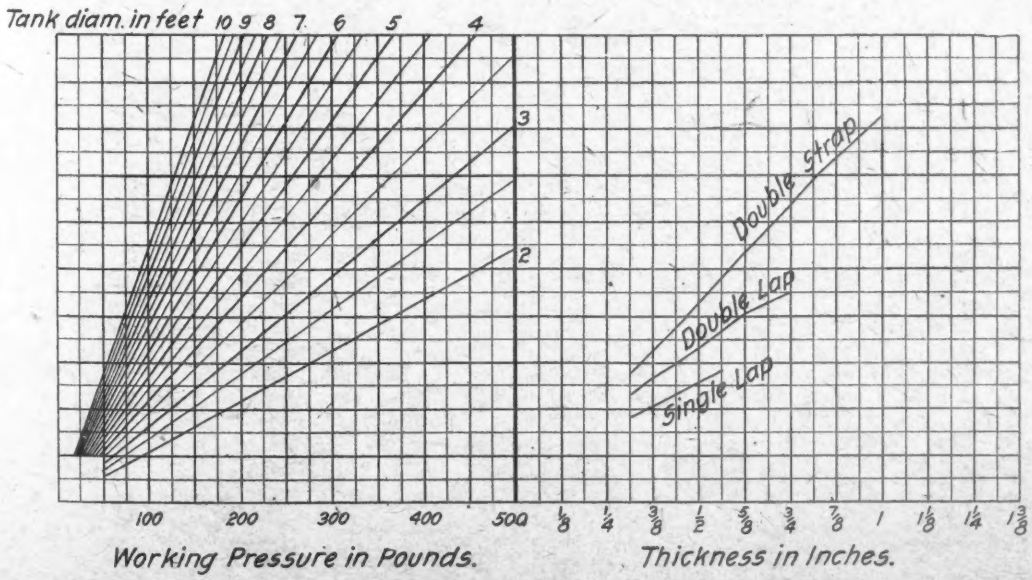
Contributed by C. R. Whittier

PLATE THICKNESS FOR PRESSURE TANKS II

$$\text{Thickness in inches} = \frac{(\text{factor of safety, 5}) \times 100 \times \text{working pressure in pounds} \times \text{diam. in inches}}{2 \times (\text{breaking stress, 55000}) \times \text{efficiency in per cent}}$$

$$= \frac{0.004545 \times \text{working pressure in pounds} \times \text{diam. in inches}}{E}$$

Efficiency E = for double strap, triple riveted butt joint, 83 to 85 per cent,
for double riveted lap joint, 60 to 74 per cent,
for single riveted lap joint, 51 to 59 per cent.

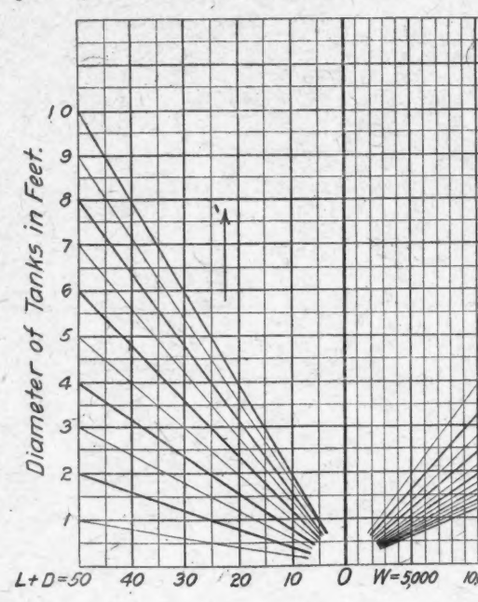

Tank diam. in feet 10 9 8 7 6 5 4
3
2
Double Strap
Double Lap
Single Lap
100 200 300 400 500
1/8 1/4 3/8 1/2 5/8 3/4 7/8 1 1 1/8 1 1/4 1 3/8
Working Pressure in Pounds.
Thickness in Inches.

al Pressure Tanks," and "Properties of Sections for Punch and Shear Frames."

WEIGHTS OF CYLIND

Average shipping weights of cylindrical pressure
than shell, and with manholes, nozzles and ins
L = length in feet,
D = diameter in feet,
T = thickness in 16ths of an inch,
P = pressure per square inch,
W = weight in pounds = 10DT(L+D).

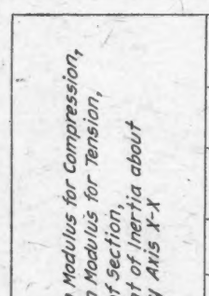
For double strap
For lap joint d
For lap joint s
G = capacity in



Contributed by C. R. Whittier

PROPERTIES OF SECTIONS FOR PUNCH AND SHEAR FRAMES—IV

S_c = Section Modulus for Compression,
S_t = Section Modulus for Tension,
A = Area of Section,
I = Moment of Inertia about Gravity Axis X-X



B	b	h=1½	H	A	I	S_c	S_t	B	b	h=1½	H	A	I	S_c	S_t
10	10	¼	0.57	15.36	228.51	35.20	65.40	8	7	⅝	3.00	36.41	377.05	58.0	108.0
"	"	⅜	1.10	23.43	311.78	47.95	89.10	"	6	¼	0.43	12.43	155.80	23.9	44.5
"	"	½	1.80	31.82	397.83	61.20	113.70	"	"	⅜	0.91	18.07	221.14	34.0	63.1
"	9	¼	0.51	14.66	200.77	30.89	57.36	"	"	½	1.50	24.20	283.77	43.5	80.8
"	"	⅜	0.99	21.64	290.32	44.66	82.95	"	"	⅝	2.36	31.79	339.75	52.3	96.9
"	"	½	1.61	29.56	371.95	57.22	106.27	"	5	¼	0.33	11.61	139.76	21.42	39.9
"	"	⅝	2.41	38.69	438.24	67.44	125.21	"	"	⅜	0.75	16.81	204.37	31.41	58.4
"	8	¼	0.44	13.87	180.98	27.80	51.50	"	"	½	1.25	22.27	261.65	40.25	75.2
"	"	⅜	0.88	20.41	272.07	41.90	77.70	"	"	⅝	2.00	29.00	310.74	49.7	88.8
"	"	½	1.38	27.27	345.47	53.20	98.50	"	"	¾	2.75	35.66	350.65	54.0	100.0
"	"	⅝	2.04	35.20	410.37	63.10	117.00	7	7	¼	0.70	13.52	169.40	26.04	48.4
"	"	¾	3.50	49.63	462.98	71.20	132.00	"	"	⅜	1.40	19.99	243.80	37.5	69.6
"	7	¼	0.38	13.15	172.76	26.50	49.30	"	"	½	2.44	27.28	310.80	47.8	88.8

Contributed by Alton L. Smith

pressure and discharge tanks with dished heads $\frac{1}{16}$ inch thicker
les and inside pipes, compiled from actual tanks.
uble strap, triple riveted long. seams, $T=0.01DP$ (min.$=\frac{5}{16}$) $W=P\left(\frac{G}{60}+0.1D^3\right)$,
p joint double riveted long. seams, $T=0.013DP$ (min.$=\frac{5}{16}$) $W=P\left(\frac{G}{46}+0.13D^3\right)$,
p joint single riveted long. seams, $T=0.016DP$ (min$=\frac{5}{16}$) $W=P\left(\frac{G}{37}+0.16D^3\right)$,
pacity in gallons $=6LD^2$.

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